DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Andrew Dunlap on 3/19/2008.

Claims 1, 27, 28, and 29 are to be edited as follows:

Claim 1 (Currently Amended) An optimizing method that optimizes, using a computer, a component mounting order in which a mounter, equipped with a mounting head, picks up L components, L being no less than 2, from an array of component feeders that hold components, and mounts the components on a board,

Deleted: , at maximum,

wherein the mounting head has, at maximum, L pickup nozzles attached thereto for picking up the components, and

wherein a plurality of components, of which the mounting order is to be optimized, includes a plurality of types of components to be picked up using no less than 2 pickup nozzles of different types,

the optimizing method comprising:

determining a nozzle set, from a plurality of pickup nozzles, for mounting the plurality of components using a smallest possible number of tasks, where a nozzle set is a combination of pickup nozzles in which (i) only the types of the pickup nozzles and a number of the pickup nozzles to be attached to the mounting head are previously set and (ii) a

correspondence between the types of the pickup nozzles and mounting positions of the pickup nozzles is not previously set, and where a task is a group of components to be mounted by one iteration of a repeated series of processes where the mounting head picks up, transports, and mounts the components; and

determining an order of the array of component feeders and a component mounting order, while maintaining the determined nozzle set.

Claim 27 (Currently Amended) An optimizing apparatus that optimizes, using a computer, a component mounting order in which a mounter, equipped with a mounting head, picks up L components, L being no less than 2, from an array of component feeders that hold components, and mounts the components on a board,

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wherein the mounting head has, at maximum, L pickup nozzles attached thereto for picking up the components, and

wherein a plurality of components, of which the mounting order is to be optimized, includes a plurality of types of components to be picked up using no less than 2 pickup nozzles of different types,

the optimizing apparatus comprising:

a nozzle set determination unit operable to determine a nozzle set, from a plurality of pickup nozzles, for mounting the plurality of components using a smallest possible number of tasks, where a nozzle set is a combination of pickup nozzles in which (i) only the types of the pickup nozzles and a number of the pickup nozzles to be attached to the mounting head are previously set and (ii) a correspondence between the types of the pickup nozzles and mounting positions of the pickup nozzles is not previously set, and where a task is a group of components to be mounted by one iteration of a repeated series of processes where the mounting head picks up, transports, and mounts the components; and

a mounting order determination unit operable to determine an order of the array of component feeders and a component mounting order, while maintaining the determined nozzle set.

Claim 28 (Currently Amended) A mounter comprising a mounting head which picks up L components, L being no less than 2, from an array of component feeders that hold components, and mounts the components on a board,

wherein the components are mounted in a mounting order optimized by the optimizing method according to Claim 1.

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Claim 29 (Currently Amended) A computer-readable storage medium having a program stored thereon, the program for optimizing a component mounting order in which a mounter, equipped with a mounting head, picks up L components, L being no less than 2, from an array of component feeders that hold components, and mounts the components on a board, the program causing a computer to execute the optimizing method according to Claim 1.

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Allowable Subject Matter

1. The following is an examiner's statement of reasons for allowance: claims 1-29 are considered allowable since when reading the claims in light of the specification, none of the references of record alone or in combination disclose or suggest the combination of limitations specified in the independent claims, specifically "determining a nozzle set, from a plurality of pickup nozzles, for mounting the plurality of components using a smallest possible number of tasks, where a nozzle set is a combination of pickup nozzles in which (i) only the types of the pickup nozzles and a number of the pickup nozzles to be attached to the mounting head are previously set and (ii) a correspondence between the types of the pickup nozzles and mounting positions of the pickup nozzles is not previously set, and where a task is a group of components

to be mounted by one iteration of a repeated series of processes where the mounting head picks up, transports, and mounts the components" as disclosed in independent claims 1 and 27 of the instant application (as defined at e.g., page 3, lines 9 through page 5, line 8 of the specification of the instant application), as specified in claims 1 and 27.

The Prior art of reference Maenishi (WO 02-13590) discloses a method for selecting a nozzle pattern that results in the lowest number of nozzle change operations (see page 254, lines 13-15), wherein a nozzle pattern is defined as a pattern in which the nozzle types correspond to the positions at which the nozzles are fitted into the pickup head (see page 248, lines 13-16 and figure 156). Therefore Maenishi teaches that the correspondence between the types and positions of the nozzles is previously set as opposed to the claim language in the instant application which states that there is no previously set correspondence between the type and location of the nozzle heads.

A practical application of the invention is shown on page 4 of the specification which states "The time required for interchanging the nozzles and executing the tasks, which takes a large proportion of the whole tact, is reduced and thereby the mounting time is shortened on the whole."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael D. Masinick whose telephone number is (571) 272-3746. The examiner can normally be reached on Mon-Fri, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael D Masinick/
Primary Examiner, Art Unit 2128